

C l a i m s

1. A valve device for preventing unintentional fluid outflow from a drinking container (32), the device being underpressure-activated and, when in position of use, being connected to an outflow opening in the container (32), characterized in that the device consists of two flexible pressure-sensitive membranes (2, 4) constituting an outer membrane (2) and an inner membrane (4), respectively, that are placed at an axial distance from one another, and their peripheral attachment areas are pressure-sealingly interconnected, the constellation of which defines an intermediate reference pressure chamber (6), and that the chamber (6) is provided with at least one vent (8) placed outside of the activation surfaces of the membranes (2, 4) and in communication with an ambient pressure P1, and that one of the two membranes (2, 4) is fixedly connected to a through-put flow pipe (10) for said fluid, and that the other of the two membranes (2, 4) is provided with a through-going membrane opening (12) within which the pipe (10) is movably arranged, and that the membrane opening (12) is associated with a primary sealing body (18) arranged to seal against fluid flow via the pipe (10), and with a secondary sealing body (16) arranged to provide a seal between the chamber (6) and an internal pressure P3 in the container (32), and that both sealing bodies (16, 18) are placed in pressure-sealing contact with the pipe (10) when the valve device is in an inactive position of rest, while at least the primary sealing body (18) is placed in an open position when the valve device is in an active position, the valve device

being activated by applying an underpressure P2 to the outside of the outer membrane (2) and moving it relative to the inner membrane (4).

2. A valve device according to claim 1,

5 characterized in that the flow pipe (10) is fixedly connected to the outer membrane (2), while the inner membrane (4) is provided with the membrane opening (12) for the pipe (10) and also associated with the primary sealing body (18) and the secondary sealing body
10 (16).

3. A valve device according to claim 2,

characterized in that the primary sealing body (18) consists of a sealing plate that is placed on the inside of the inner membrane (4), and that is
15 connected to the inner membrane (4) by means of at least one stay (20) by-passable to flow, the sealing plate (18) having a shape that causes pressure-sealing when bearing against the inwardly projecting, free end portion of the flow pipe (10).

20 4. A valve device according to claim 2 or 3,

characterized in that the secondary sealing body (16) is a flexible, ring-shaped sealing lip arranged about the membrane opening (12).

5. A valve device according to claim 2, 3 or 4,

25 characterized in that the primary sealing body (18) is provided with a perforation pin or point (54) in order to puncture a wall of the drinking container (32).

6. A valve device according to one of claims 2-5,
characterized in that a pipe length section
of the flow pipe (10) has a uniform outer diameter, the
secondary sealing body (16) being placed pressure-
sealingly against and moving along said pipe length
section during activation of the valve device, whereby a
permanent pressure seal exists between the reference
pressure chamber (6) and the drinking container (32).

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7. A valve device according to one of claims 2-5,
characterized in that the flow pipe (10)
has a reduced outer diameter in at least the free end
portion thereof, whereby a vent gap (22) is formed
between the flow pipe (10) and the secondary sealing body
(16) when the sealing body (16), upon activation of the
valve device, is placed directly opposite a pipe length
portion having a reduced outer diameter, thereby allowing
venting from the reference pressure chamber (6) to the
drinking container (32).

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8. A valve device according to claim 7,
characterized in that the inwardly
projecting free end portion of the flow pipe (10) is
provided with a recessed area (14) having a uniformly
reduced outer diameter.

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9. A valve device according to claim 7,
characterized in that the flow pipe (10)
has a conical shape, thereby having a progressively
decreasing outer diameter towards the inwardly
projecting, free end portion of the flow pipe (10).

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10. A valve device according to claim 1,

characterized in that the flow pipe (10) is fixedly connected to the inner membrane (4), while the outer membrane (4) is provided with the membrane opening (12) for the pipe (10) and also associated with the primary sealing body (18) and the secondary sealing body (16).

11. A valve device according to claim 10,

characterized in that the pipe wall of the flow pipe (10) is provided with at least one flow aperture (70) at the free, outer end thereof, while the flow pipe (10) itself is sealed at the same end, and that the outer membrane (2) is provided with a seal housing (72) within which the membrane opening (12) for the pipe (10) is placed, about which membrane opening (12) the seal housing (72) is provided with an outer, ring-shaped primary sealing lip (18) that, when in position of rest, is placed in a flexible, pressure-sealing manner against the pipe wall outside of said at least one flow aperture (70), and the seal housing (72) also is provided with an inner, ring-shaped secondary sealing lip (16) that, at all times, is placed pressure-sealingly against a pipe wall area having a uniform outer diameter within said at least one flow aperture (70), the outer primary sealing lip (18) being moved away from the flow pipe (10) and opening to fluid flow via the at least one flow aperture (70) upon activation of the valve device.

12. A valve device according to any one of the preceding

claims, characterized in that the device is formed within, formed as or in connection with a cap

(1, 58), a drinking spout (24) or as part of the cap (1, 58) or the drinking spout (24), the cap (1, 58) or the drinking spout (24) being connected to the drinking container when in position of use.

- 5 13. A valve device according to any one of the preceding claims, characterized in that the device is provided with a protective cover (28).
14. A valve device according to claim 13, characterized in that the protective cover (28) is provided with an internal cover pipe (29) that projects inwards toward the valve device and is in contact with the outer membrane (2) and keeping it in place for secure closing of the valve device during transport and storage.